TABLE H.1
BLOOD LEAD CONCENTRATION CALCULATIONS
ROLLING KNOLLS LANDFILL SUPERFUND SITE

Scenario Timeframe : Current/Future
Medium : Soil
Exposure Medium : Surface Soil
Exposure Point: Human Use Area - Landscape Area 1
Receptor Population: Landscaper (1)

Parameter Code	Parameter Definition	Value	Units	Rationale/ Reference	Adult Lead Model Equations[2]
PbS	Soil lead concentration	495	µg/g or ppm	Site Data (3)	$PbB_{adult,central} = PbB_{adult,0} + \frac{PbS * BKSF * IR_S * AF_S * EF_S}{AT}$ $PbB_{fetal,0.95} = PbB_{adult,central} * GSD_{i,adult}^{1.645} * R_{fetal/maternal}$
$R_{fetal/maternal}$	Fetal/maternal PbB ratio	0.9	unitless	USEPA 2003 (4)	
BKSF	Biokinetic Slope Factor	0.4	µg/dL per µg/day	USEPA 2003 (4)	
GSD_i	Geometric standard deviation PbB	1.8	--	USEPA 2009 (5)	
PbB_0	Baseline PbB	1.0	µg/dL	USEPA 2009 (5)	
IR_S	Soil ingestion rate (including soil-derived indoor dust)	0.100	g/day	USEPA 2002, 2011 (6)	
$AF_{S,D}$	Absorption fraction (same for soil and dust)	0.12	--	USEPA 2003 (4)	
$EF_{S,D}$	Exposure frequency (same for soil and dust)	219	days/yr	USEPA 2003, 2004 (6)	
$AT_{S,D}$	Averaging time (same for soil and dust)	365	days/yr	USEPA 2003 (4)	

Blood Lead Concentration/Probability Estimates - Soil Exposure			
$PbB_{adult,central}$	**Blood lead concentration of adult worker, geometric mean**	**2.4**	**µg/dL**
$PbB_{fetal,0.95}$	95th percentile blood lead concentration among fetuses of adult workers	6	µg/dL
PbB_t	Target PbB level of concern	10	µg/dL
$P(PbB_{fetal}>PbB_t)$	**Probability of fetal blood lead concentration exceeding PbBt**	**0.5%**	**%**

Notes:

1. Landscaper is a person 18 to 65 years of age.
2. Blood lead concentration and probability of PbB exceeding the target PbB level were calculated using the Adult Lead Methodology (USEPA 2003a, 2003b), adopted from the USEPA spreadsheet version dated June 21, 2009.
3. Estimated using the arithmetic mean lead concentration from surface soil samples (i.e., from 0 to 1 foot below ground surface) collected in Landscape Area 1.
4. Default value.
5. Default value based on data from National Health and Nutrition Examination Surveys conducted from 1999 to 2004.
6. Default value for outdoor worker and soil contact-intensive activities.

References:

United States Environmental Protection Agency. 2002. Supplemental Guidance for Developing Soil Screening Levels for Superfund Sites. OSWER 9355.4-24. Office of Solid Waste and Emergency Response, Washington, D.C., December, 185 pp.

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United States Environmental Protection Agency. 2004. Risk Assessment Guidance for Superfund (RAGS), Volume I, Human Health Evaluation Manual, Part E, Supplemental Guidance for Dermal Risk Assessment. EPA/540/R-99/005. Office of Superfund Remediation and Technology Innovation, Washington, D.C., July, 181 pp

United States Environmental Protection Agency. 2009. Update of the Adult Lead Methodology's Default Baseline Blood Lead Concentration and Geometric Standard Deviation Parameters, Washington, DC, June, 11 pp.

United States Environmental Protection Agency. 2011. Frequent Questions from Risk Assessors on the Adult Lead Methodology (ALM). http://www.epa.gov/superfund/lead/almfaq.htm.